

REMARKS

Entry of the foregoing, reexamination and further and favorable reconsideration of the subject application in light of the following remarks, pursuant to and consistent with 37 C.F.R. § 1.112, are respectfully requested.

Prior to the current amendment, claims 1-8, 12-20, 22, 24, 26, 27 and 30 were pending in the application. Of these, claims 4-7 and 18-20 were withdrawn from consideration.

By the present amendment, claims 12-14 and 30, and withdrawn claims 4-7 and 18-20 have been canceled without prejudice or disclaimer of the subject matter described therein.

Independent claims 1 and 15 have been amended to recite that plant promoters of the chimeric genes according to the invention are selected from a constitutive promoter, a subclover stunt virus promoter, a fibre specific or fibre-enhanced promoter, a primary cell wall promoter or a secondary cell wall promoter. Support for this amendment can be found at several places in the specification, e.g. page 21 , lines 8-10; page 21, lines 18-23; page 22, lines 1-4 or page 22, lines 13-16.

No prohibited new matter has been introduced by way of the above amendments. Applicants reserve the right to file a continuation or divisional application on subject matter canceled by way of this Amendment.

Rejections under 35 U.S.C. § 103

Claims 1-3, 8-10, 12-17 stand rejected under 35 U.S.C. § 103 as allegedly unpatentable over Conner (US patent 6,080,914) in view of Ruan et al., Plant Physiology, Vol 115, pp. 375-385 and further in view of Applicants' specification. In as far as the rejection might be applied to the amended claims, Applicants respectfully traverse.

The prior art fails to establish a proper prima facie case of obviousness. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. M.P.E.P. § 2143.

Applicants maintain that a person skilled in the art would not have been motivated to combine the cited references to arrive at the currently claimed inventions, nor would such person have had any reasonable expectation of success.

Applicants respectfully submit that the Examiner appears to have misapprehended the scientific basis of the invention, being under the impression that the claimed methods are directed at the use of sucrose synthase activity to increase the sink activity of a cotton fiber cell so that more carbon can be directed into the cellulose biosynthesis pathway to develop longer fiber cells. The Examiner has stated "Ruan does indeed state that SuSy is critical for cellulose biosynthesis and hence fiber development." However, there is, in fact, no correlation between the fiber length and cellulose biosynthesis.

As explained by Ruan et al., *The Plant Cell*, Vol 13, 47-60, 2001 (attached –see particularly abstract as well as Figure 7, page 56), cotton fiber elongation is determined by increasing the turgor in the initial fiber cell through import of sucrose which is cleaved into hexoses by sucrose synthase activity (coordinated with closing of the plasmodesmata at the basis of the initiating fiber cell and loosening of the cell wall through the action of expansin).

When the fiber cell has reached its mature length, the plasmodesmata gates re-open thereby releasing the turgor pressure. It is only at this stage that cellulose is massively synthesized and deposited in the secondary cell wall. ***Accordingly, there is no correlation between the fiber length and cellulose biosynthesis.*** Short fibers may contain a high amount of cellulose, while long fibers may contain a low amount of cellulose. The role of sucrose synthase in determining fiber length is to provide the required hexoses to build up the turgor in the initiating fiber cell and not to break down sucrose provide building blocks to be used in cellulose biosynthesis.

Furthermore, Ruan et al. do not teach or suggest the notion that SuSy may be a rate limiting factor for fiber length development. Contrary to the Examiner's statement on page 3 of the office action mailed 12/20/2005, Applicants have never denied that Ruan teaches SuSy having a controlling function in cotton fiber development. Indeed, the passages cited by the Examiner, as well as the abstract all explicitly state that Susy may have a major role in portioning carbon to fiber cellulose biosynthesis. However, as indicated above, fiber length development is not correlated to cellulose biosynthesis, and Ruan et al. 1997 do not teach or suggest a role for sucrosynthase in fiber length development.

Therefore, Ruan can not have provided the motivation that the Examiner has proposed as a basis for combining the references. It was not until the demonstration by the inventors as indicated in the current specification on page 29 that a linear correlation between fiber length and sucrose synthase activity up to the wild type level could be observed, that it was realized that Sucrose synthase may be rate limiting for fiber length development and that overexpression of Sucrose synthase above wild type level could increase fiber length development.

In the absence of the discovery reported first by the present inventors, Ruan could not have motivated a person of ordinary skill in the art to combine Conner and Ruan to practice the claimed methods. An analysis of obviousness of a claimed combination must include consideration of the results achieved by that combination. *The Gillette Co. v. S.C. Johnson & Son Inc.*, 16 USPQ2d 1923, 1928 (Fed. Cir. 1990). Critical to the analysis is an understanding of the particular results achieved by the new combination. *Id.* (citing *Interconnect Planning Corporation v. Feil*, 227 U.S.P.Q. 543, 551 (Fed. Cir 1985)). Applicants maintain that to reconstruct a motivation from a selective reading of the prior art constitutes impermissible hindsight.. *See, e.g., Interconnect Planning Corp. v. Feil*, 227 U.S.P.Q. 543, 550 (Fed. Cir. 1985); *see also, In re Shuman*, 150 U.S.P.Q. 54, 57 (C.C.P.A 1966).

Assuming *arguendo* that a person skilled in the art did follow the teachings of the combined references, the person of ordinary skill in the art would still not have arrived at the present invention. US patent 6,080,914, column 1 lines 45-64, teaches the use of strawberry fruit (receptacle) specific promoters linked to sucrose synthase coding region as being useful in accessory fruit bearing plants where the major portion of the edible fruit comprises receptacle tissue. However, such a construct could not be used in the present methods. Cotton balls represent “traditional fruit”. Cotton fiber cells develop from the cotton seed coat, and not from the mature or maturing ovaries of “traditional fruit”. Accordingly, the suitability of chimeric genes comprising receptacle-tissue specific promoters linked to sucrose synthase coding region to influence fiber length development in cotton fiber cells is highly questionable.

The claims as currently presented have been amended to recite that plant promoters of the chimeric genes according to the invention are selected from a constitutive promoter, a

subclover stunt virus promoter, a fibre specific or fibre-enhanced promoter, a primary cell wall promoter or a secondary cell wall promoter. Even combined, the references do not teach or suggest all of the features of chimeric genes according to the invention.

Fro at least the foregoing reasons, withdrawal of the rejection is respectfully requested.

CONCLUSION

In view of the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order. Such action is earnestly solicited.

In the event that there are any questions relating to this application, it would be appreciated if the Examiner would telephone the undersigned concerning such questions so that prosecution of this application may be expedited.

The Director is hereby authorized to charge any appropriate fees that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

Respectfully submitted,

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